

### **REMARKS**

Upon entry of the amendments in this paper, claims 1-3 will be pending in the above-identified application. Claims 1-3 are herein amended. No new matter is entered. It is respectfully submitted that this paper is fully responsive to the Office action mailed on March 13, 2009.

### **Specification**

The Examiner objected to the specification because of minor informalities.

To expedite prosecution, Applicants herein amend the specification to correct the informalities pointed out by the Examiner. Accordingly, Applicants request favorable reconsideration of this objection.

### **Claim Rejections - 35 U.S.C. §112**

Claim 1 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

To clarify the subject matter of the claimed invention, Applicants herein amend claim 1 in the manner presented in the attached Proposed Listing of Claims. Accordingly, Applicants request favourable reconsideration of this rejection.

**Claim Rejections - 35 U.S.C. §102**

Claims 1 and 2 were rejected under 35 U.S.C. §102(b) as anticipated by *Nishimura et al.* (US 6,481,305), as best understood.

Anticipation requires the presence of each and every claim limitation in a single prior art reference.

The *Nishimura et al.* reference does not disclose a roller screw wherein each of the plurality of rollers has a diameter larger than a distance between a wall surface of the roller rolling groove and a wall surface of the loaded roller rolling groove which opposes the wall surface of the roller rolling groove. In particular, the drawings (Figs. 1 and 3) do not define the precise diameters and distances of the claimed elements. Hockerson-Halberstadt, Inc. v. Avia Group International, Inc., 222 F.3d 951, 956 (Fed. Cir. 2000) (“patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.”)

Likewise, the *Nishimura et al.* reference does not disclose a roller screw wherein the loaded roller rolling groove of the nut member includes a central groove section having a pitch larger than a pitch of the screw shaft and a pair of end groove sections disposed on both sides of the central groove section and having a pitch equal to the pitch of the screw shaft. In particular, the drawings do not define the pitches of the central groove section, screw shaft, and end groove sections.

Accordingly, the *Nishimura* reference does not anticipate claims 1 and 2.

Furthermore, claim 1 has been amended, in part, to recite that the loads applied to the nut member from the plurality of rollers act in repulsing directions to each other for the  $\alpha$  group roller and  $\beta$  group roller. Accordingly, the rollers bear the load, for example, by compressing its peripheral surface between one wall surface of the roller rolling groove and one wall surface of the loaded roller rolling groove opposing to the wall surface of the roller rolling groove, so that the load only in one direction of the axial directions of the screw shaft is born. One reason why the rigidity increases by applying such a preload resides in the increasing of the number of rollers receiving the load, and hence, the reduction of the load to be applied to each roller. Whereas, when using a roller having a diameter smaller than a prescribed diameter and applied with no preload, only one of the  $\alpha$  group rollers and the  $\beta$  group rollers receives the load. However, by applying the preload, both the  $\alpha$  group rollers and the  $\beta$  group rollers receive the load, so that the number of the rollers to which the load is applied is made twice. Accordingly, it becomes possible to effectively use the rollers existing in the nut member with respect to the acting external force and to distribute the load so that the rollers which essentially do not receive the load become to receive the load.

Also, claim 2 has been amended, in part, to recite that "in order to bear the preloads in the opposing directions, the  $\alpha$  group roller in one of -the end groove sections are arranged so that the axes thereof are perpendicular to the axes of the  $\beta$  group roller in the other one of the end groove sections as viewed in the roller advancing direction, and the loads applied to the nut member from the plurality of rollers act in repulsing directions to each other for the  $\alpha$  group roller and  $\beta$  group roller". For example, a preload (compression load) shown with (1) in FIG. 7 is applied to

the roller on the side of the end groove, and a preload (compression load) shown with (2) in FIG. 7 is applied to the roller on the side of the end groove. By applying the preload to the rollers, for example, rollers having high rigidity can be provided.

Applicants submit that the features recited in the amended portions of claims 1 and 2 are neither described nor suggested by the cited reference. In view of the aforementioned remarks and claim amendments, Applicants submit that claims 1 and 2 are not anticipated by the cited reference.

Claim 3 was rejected under 35 U.S.C. §102(b) as anticipated by *Virga* (US 4,896,552).

However, the *Virga* reference discloses a nut member that is divided in an axial direction into a first nut piece 37 and a second nut piece 33, and a shim 39 is disposed between the first and second nut pieces. *See* Fig. 1. The *Virga* reference describes a ball screw instead of a roller screw using rollers.

Accordingly, the *Virga* reference does not anticipate claim 3.

Nevertheless, to expedite prosecution, Applicants herein amend claim 3 to recite that “in order to bear the preloads in the opposing directions, the  $\alpha$  group roller in one of the first nut piece and the second nut piece are arranged so that the axes thereof are perpendicular to the axes of the  $\beta$  group roller in the other one of the first nut piece and the second nut piece as viewed in roller advancing direction and the loads applied to the nut member from the plurality of rollers act in repulsing directions to each other for the  $\alpha$  group roller and  $\beta$  group roller.” For example, the preload (compression load) shown with (1) in FIG 7 is applied to the roller 6 in one of the divided nut pieces 12, and on the other hand, the preload (compression load) shown with (2) in

FIG 2 is also applied to the roller 6 in the other one of the divided nut pieces 12. By applying the preloads to the rockers 6, a high rigidity can *be* applied to the roller screw.

Applicants submit that this aspect of the claimed invention is neither described nor suggested by the cited reference. In view of the aforementioned remarks and claim amendments, Applicants submit that claim 3 is not anticipated by the cited reference.

### **Conclusion**

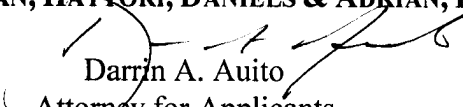
In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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